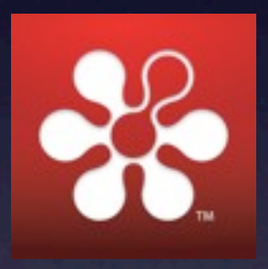
Build An App In A Week

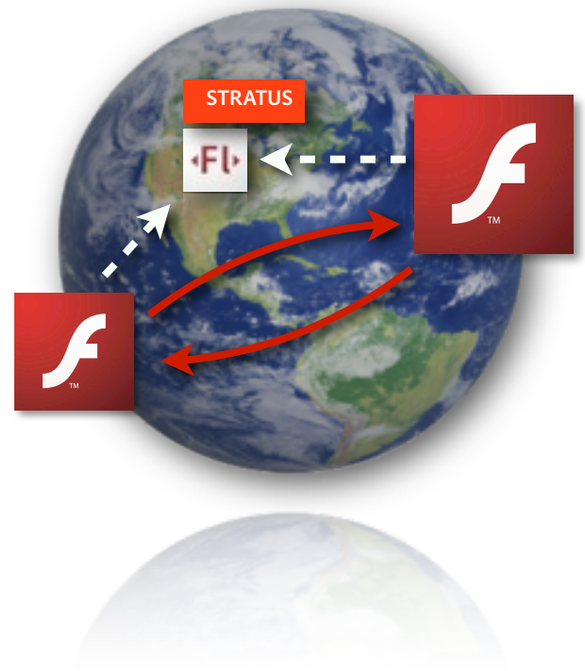


Go Multi-User With Peer-to-Peer in Flash Player 10.1

Tom Krcha
Platform Evangelist
Adobe

Agenda

- What is Peer-to-peer?
- RTMFP - protocol and implications
- Demo - P2P Instant Messenger
- Directed Routing



WHAT? P2P?

NAT/Firewall Traversal

NetGroup

Native Multicast

NetGroupSendMode

Fusion

NetGroupSendResult

NetGroupReplicationStrategy

IP Address Mobility

NetStream

Encryption

RTMFP

IT'S HUGE!

Directed Routing

Posting

Application-Level-Multicast

Bootstrap

GroupSpecifier

NetStreamMulticastInfo

Topology

Object Replication

NetGroupInfo

Partial Reliability

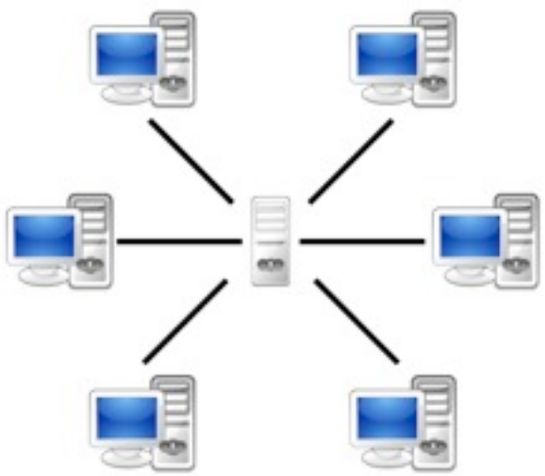
NetGroupReceiveMode

NetConnection

Congestion Control

What is Peer-to-peer?

Hub-and-Spoke network



Centralized server-based service model.

P2P network

A peer-to-peer system of nodes without central infrastructure.

Source: Wikipedia.org

Hub-and-spoke:

- centralized
- Single point of failure
- cost of a server
- adding more clients make network slower
- need failover and backups

P2P

- decentralized
- adding more clients make network faster
- robustness, no failover

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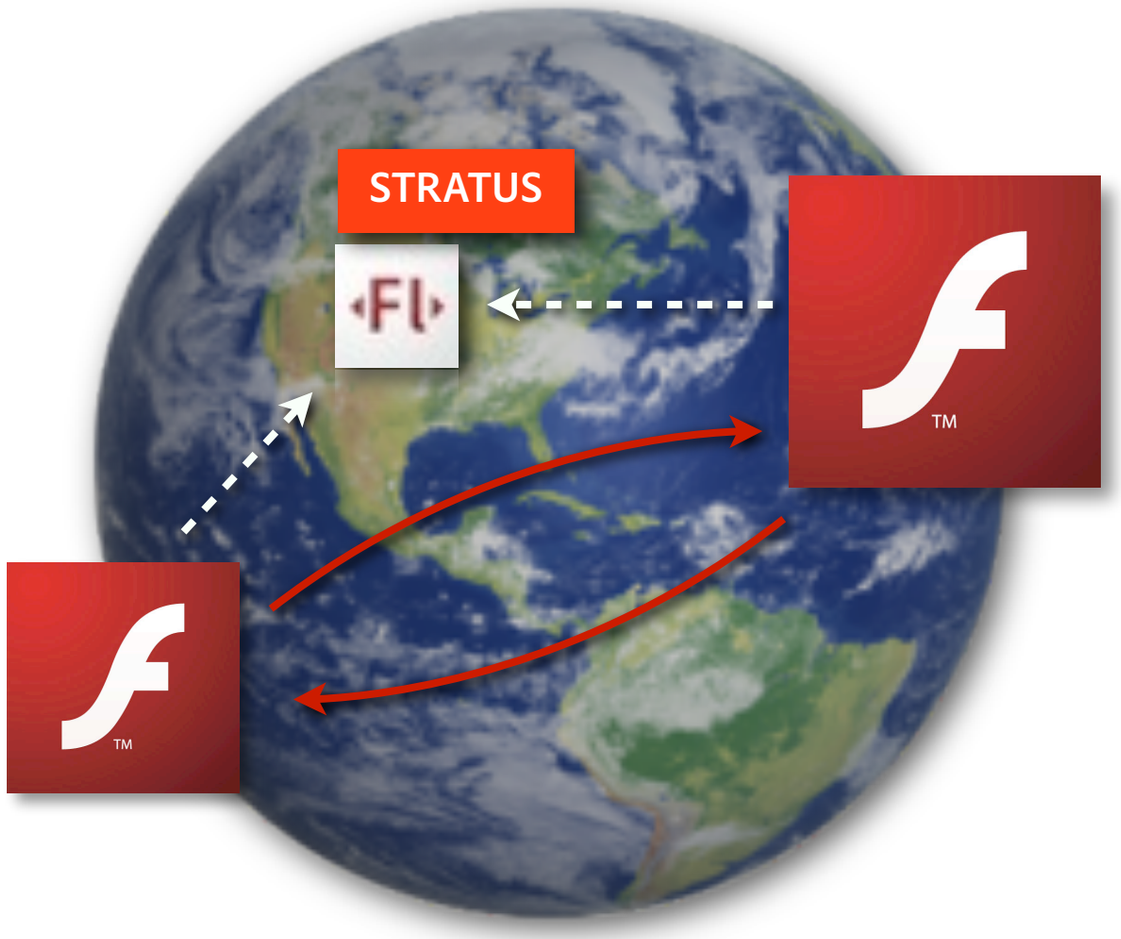
How does it work in Flash?



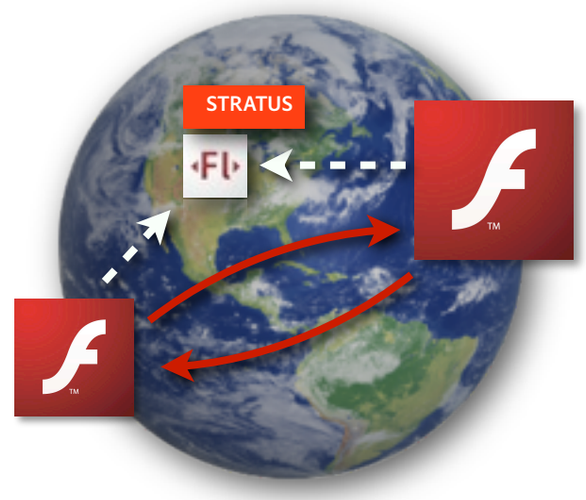
Adobe Stratus

Hosted rendezvous service
rtmfp://stratus.adobe.com

Looks like FMS, but...

- No client-server streaming
- No recording
- No server-side scripts or application logic
- Requires (free) developer key to connect

Emerging technology



Peer-to-peer in Flash Player

RTMFP

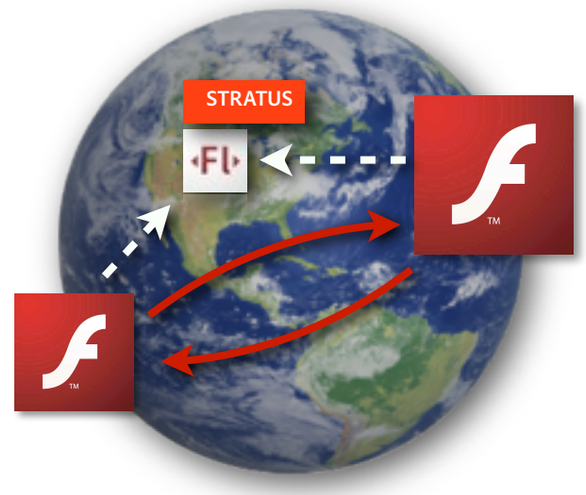
- Real Time Media Flow Protocol
- Introduced in Flash Player 10 and upgraded in FP 10.1
- Based on UDP (lossy, better latency)
- Encrypted 128-bit AES
- Need to accept every incoming connection

Adobe Stratus

Hosted rendezvous service
rtmfp://stratus.adobe.com

USE CASES

- Multiplayer games,
- VoIP
- Audio/Video
- Collaboration
- Chat



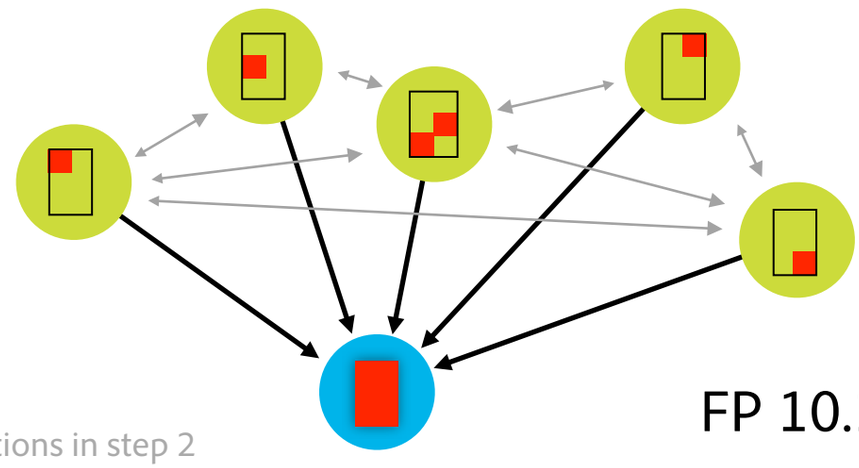
Firewall fallback to RTMP/T (Flash Media Server)

Types of P2P in Flash

- Point-to-point — one-to-one
  - Live streaming
  - Document delivery

FP 10

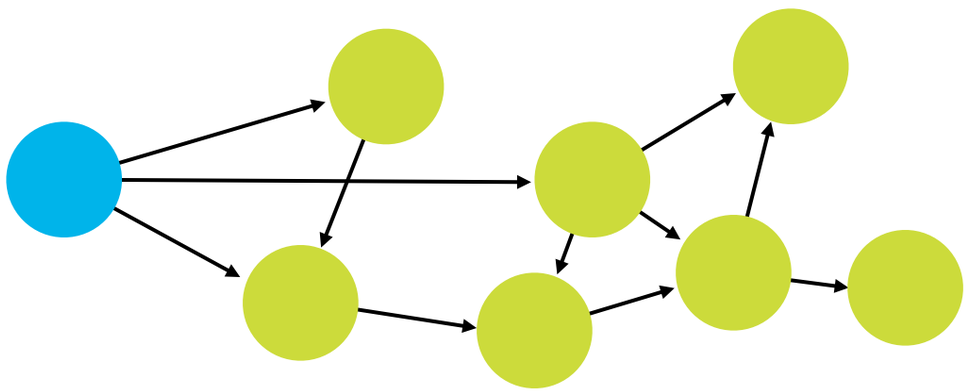
- "Swarming" — many-to-many
  - Large-file download (possibly progressive)



*Connections in step 2

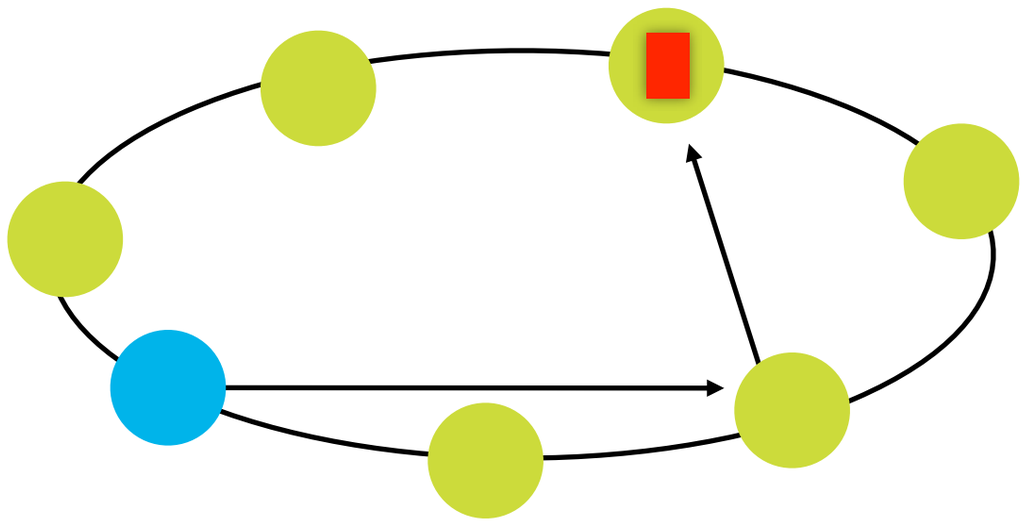
FP 10.1

- Live Application-Level Multicast — one-to-many
  - Broadcast (1 to many, some latency tolerable)
  - Interactive (many to many, or 1 to many with feedback, low latency required)



FP 10.1

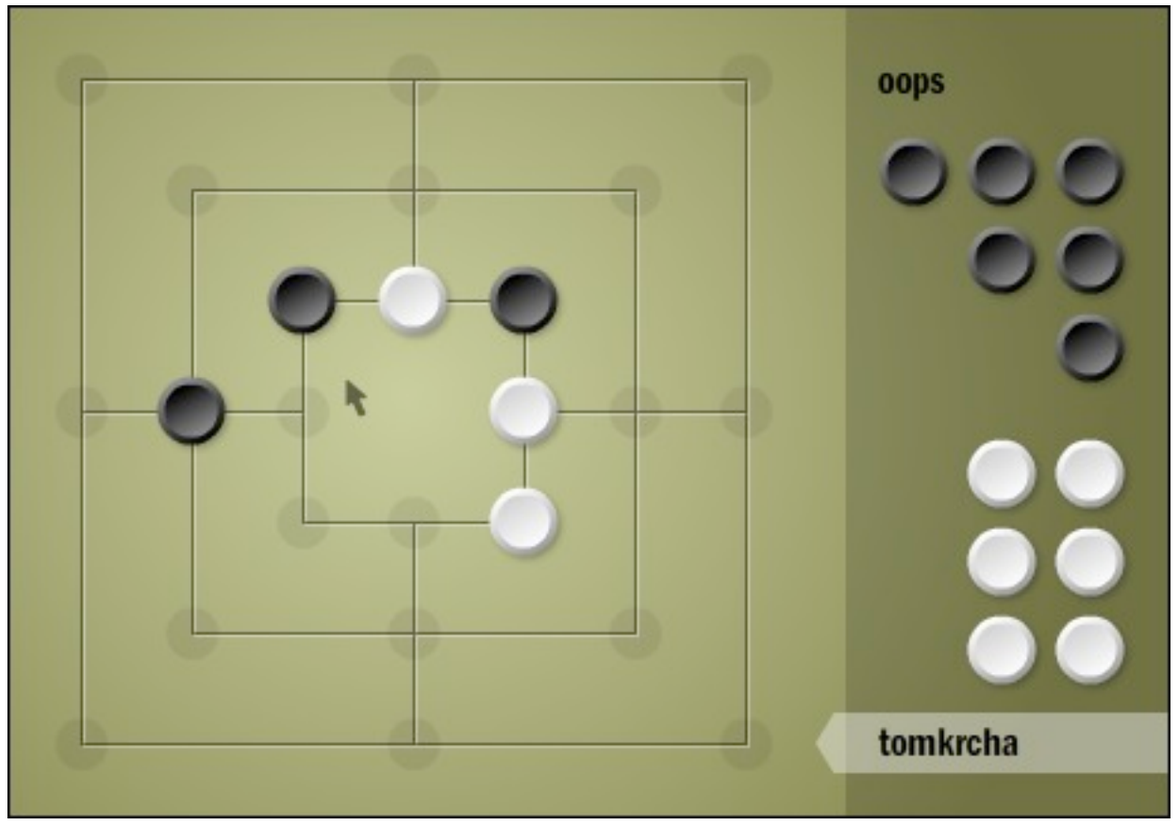
- Distributed Data Storage (distributed hash table)
  - DHT-like structures to form distributed database



FP 10.1

Peer-to-peer in Flash Player

Demo game - MILL



http://nestor.cz/mill/

Author

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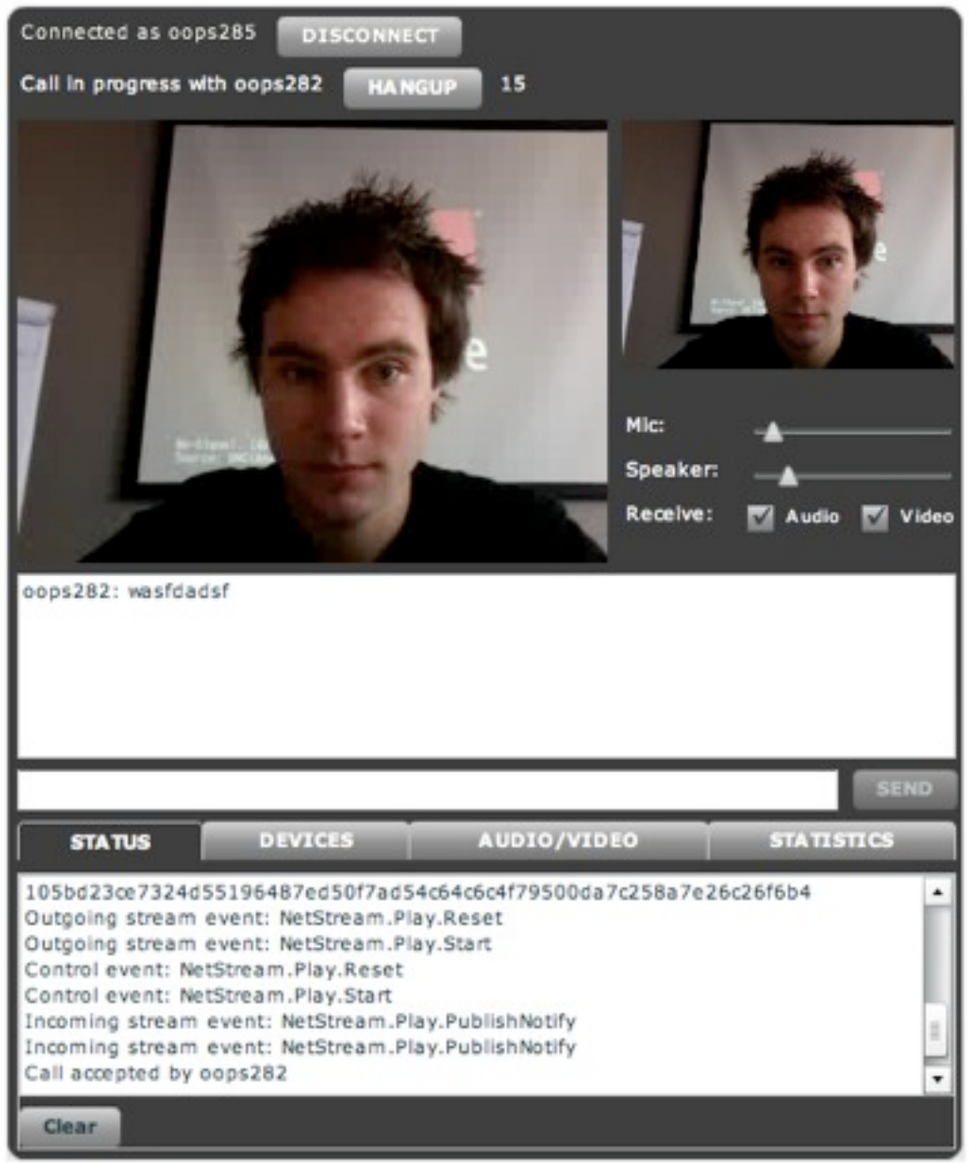
Czech Republic

Peer-to-peer in Flash Player

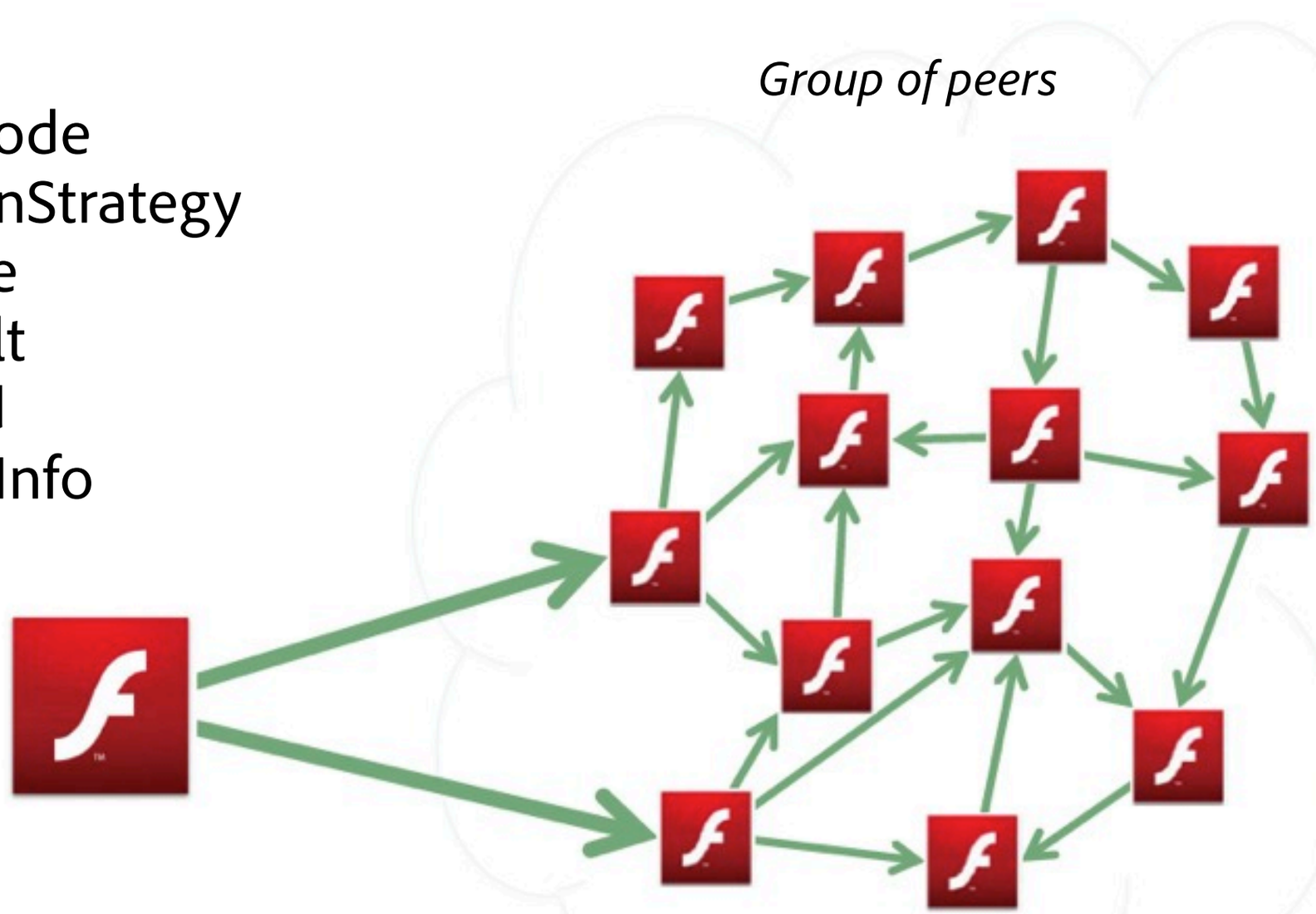
Demo app - Phone



http://labs.adobe.com/technologies/stratus/samples/

Groups & Multicast

- **GroupSpecifier**
- **NetGroup**
- NetGroupInfo
- NetGroupReceiveMode
- NetGroupReplicationStrategy
- NetGroupSendMode
- NetGroupSendResult
- **NetStream updated**
- NetStreamMulticastInfo



Demo: P2P Instant Messenger

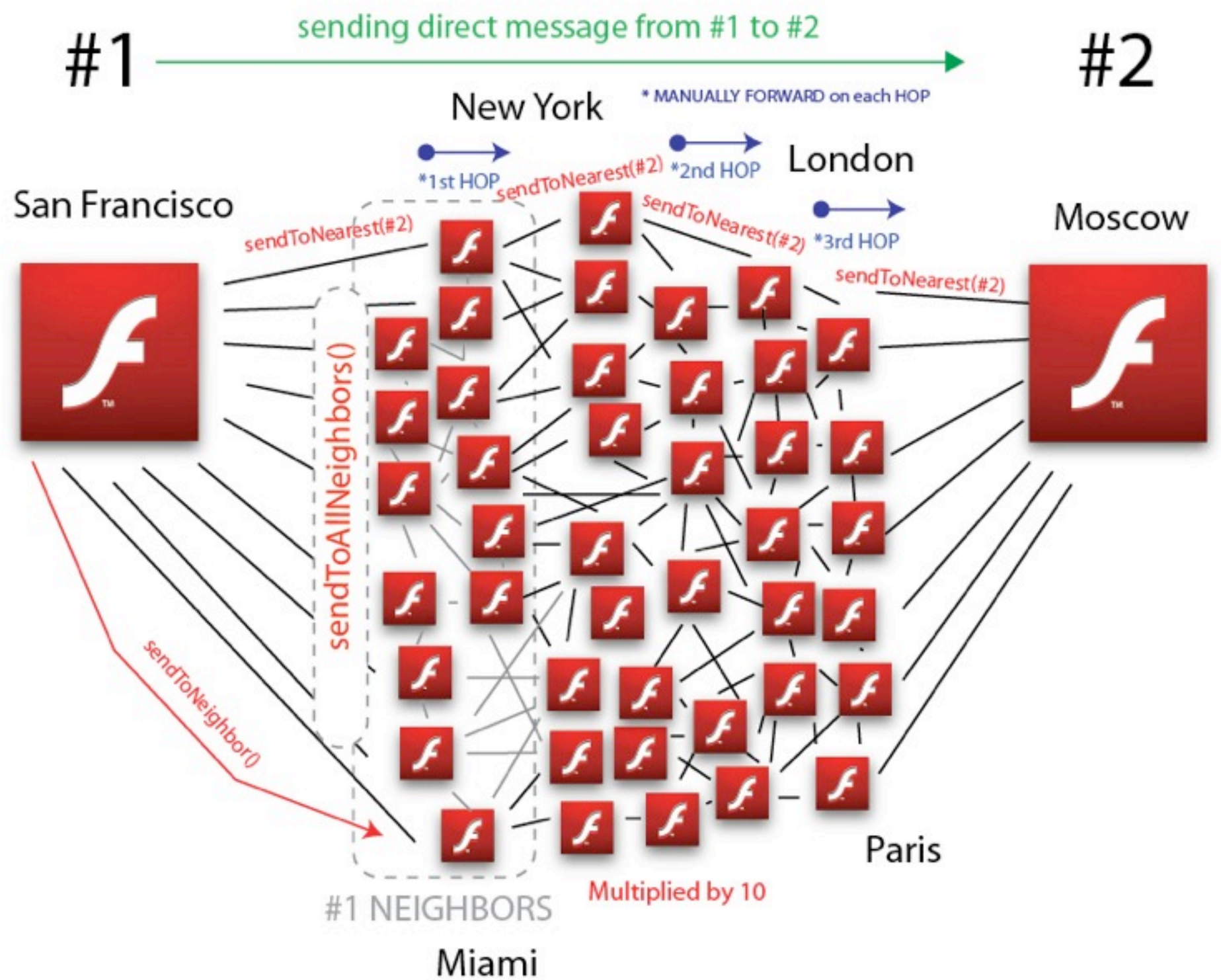
P2PChatComponent

P2PChatMobile

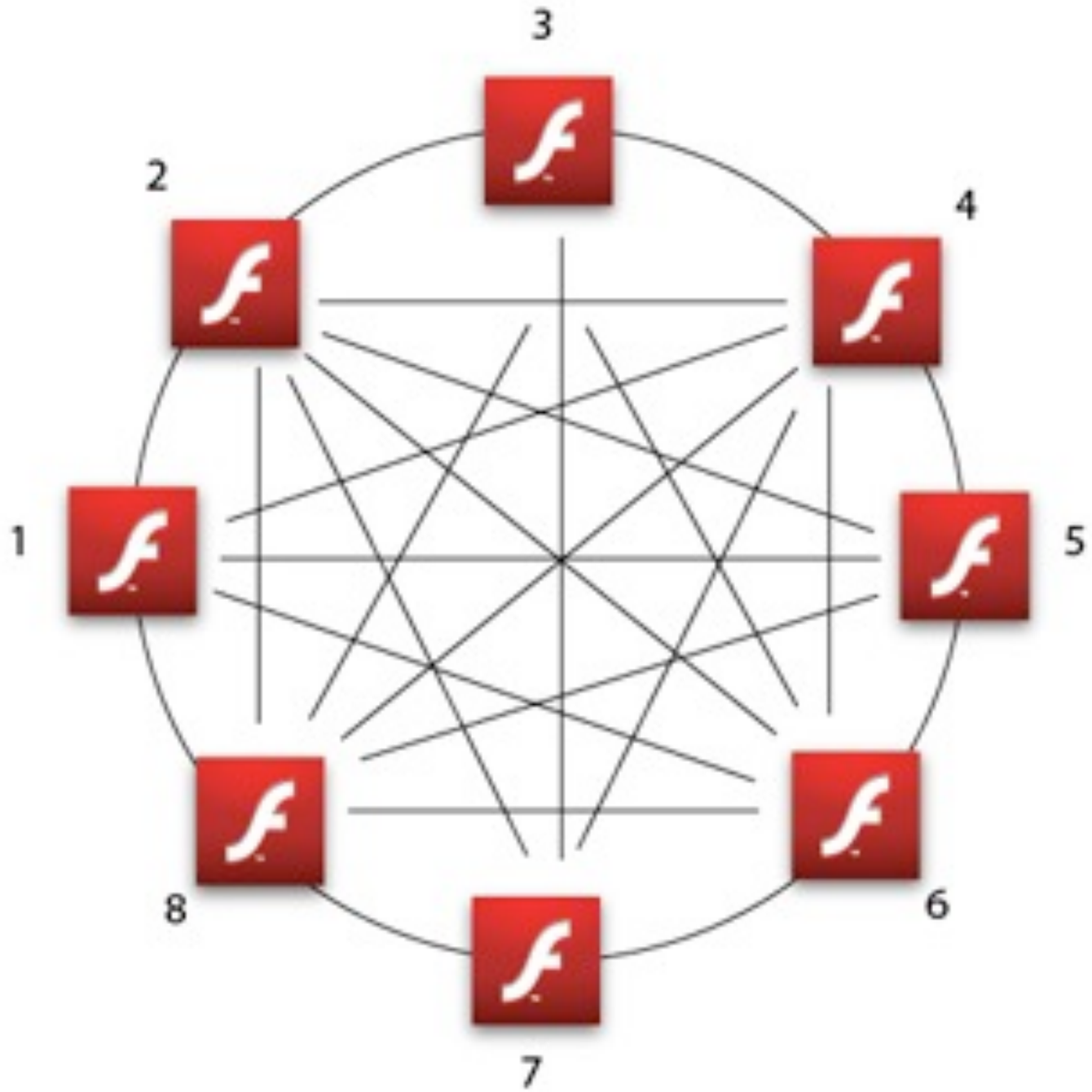
P2PMessengerLib

Demo: P2P Groups

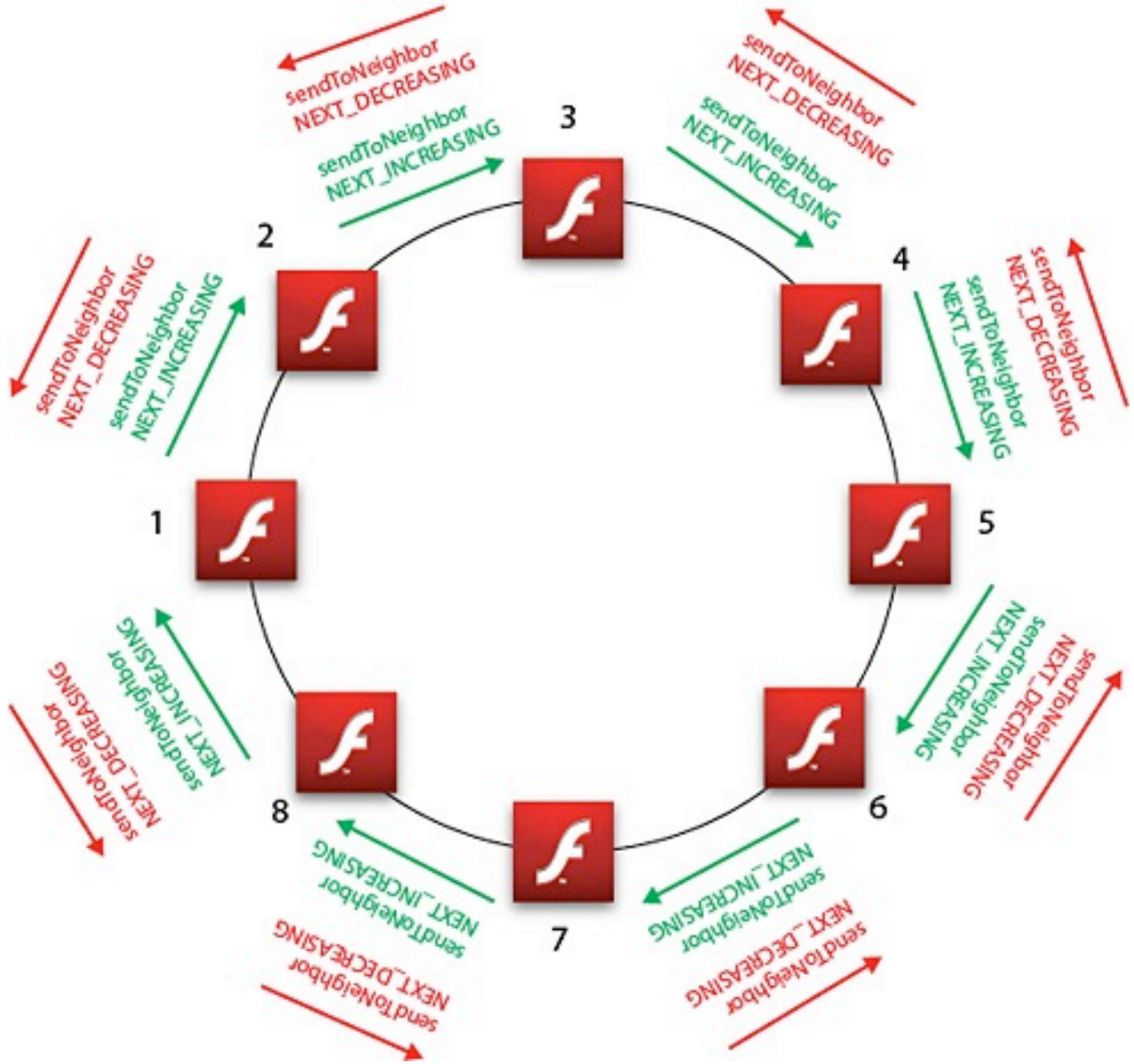
Peer-to-Peer Directed Routing



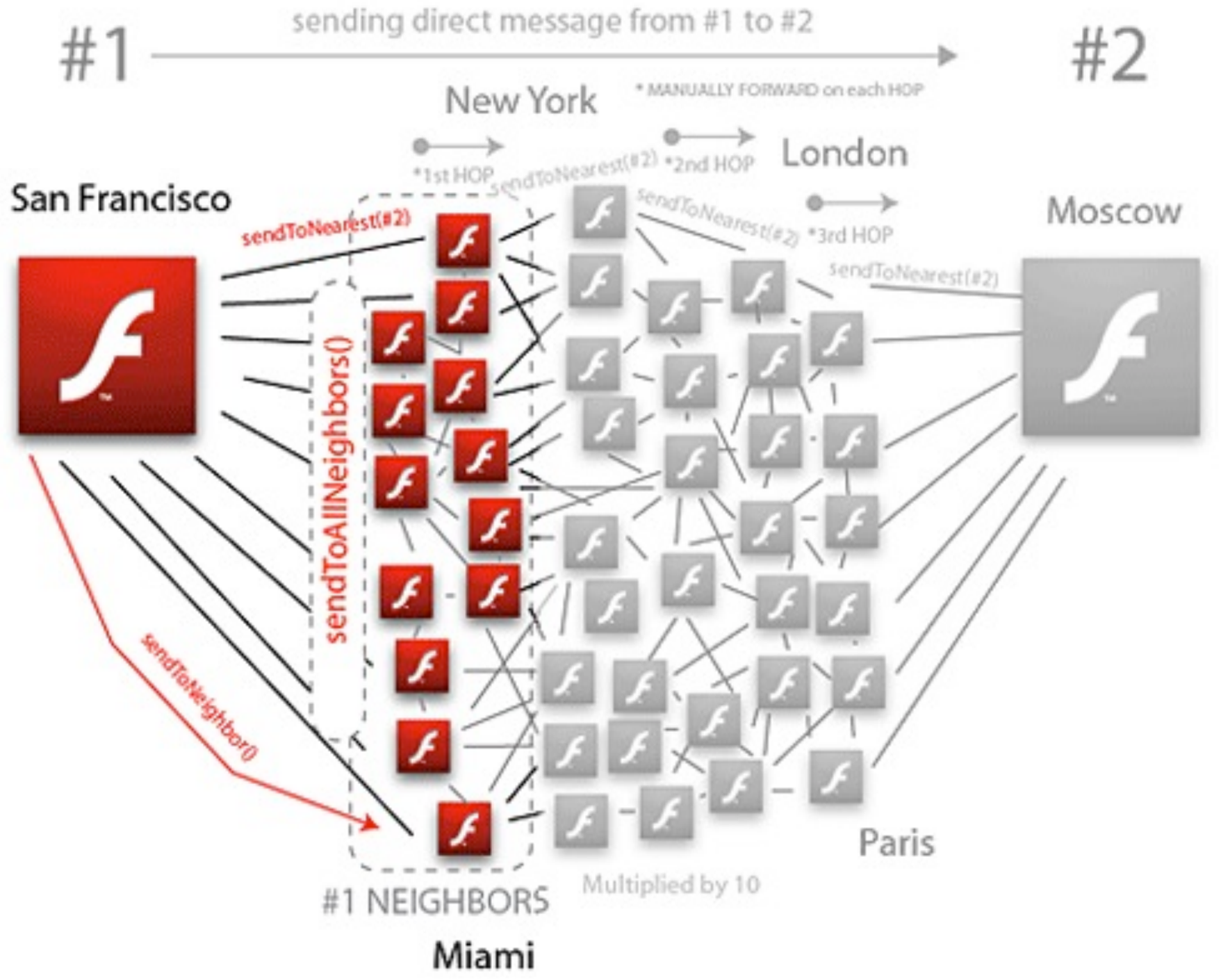
Full Mesh - P2P



Ring topology with sendToNeighbor



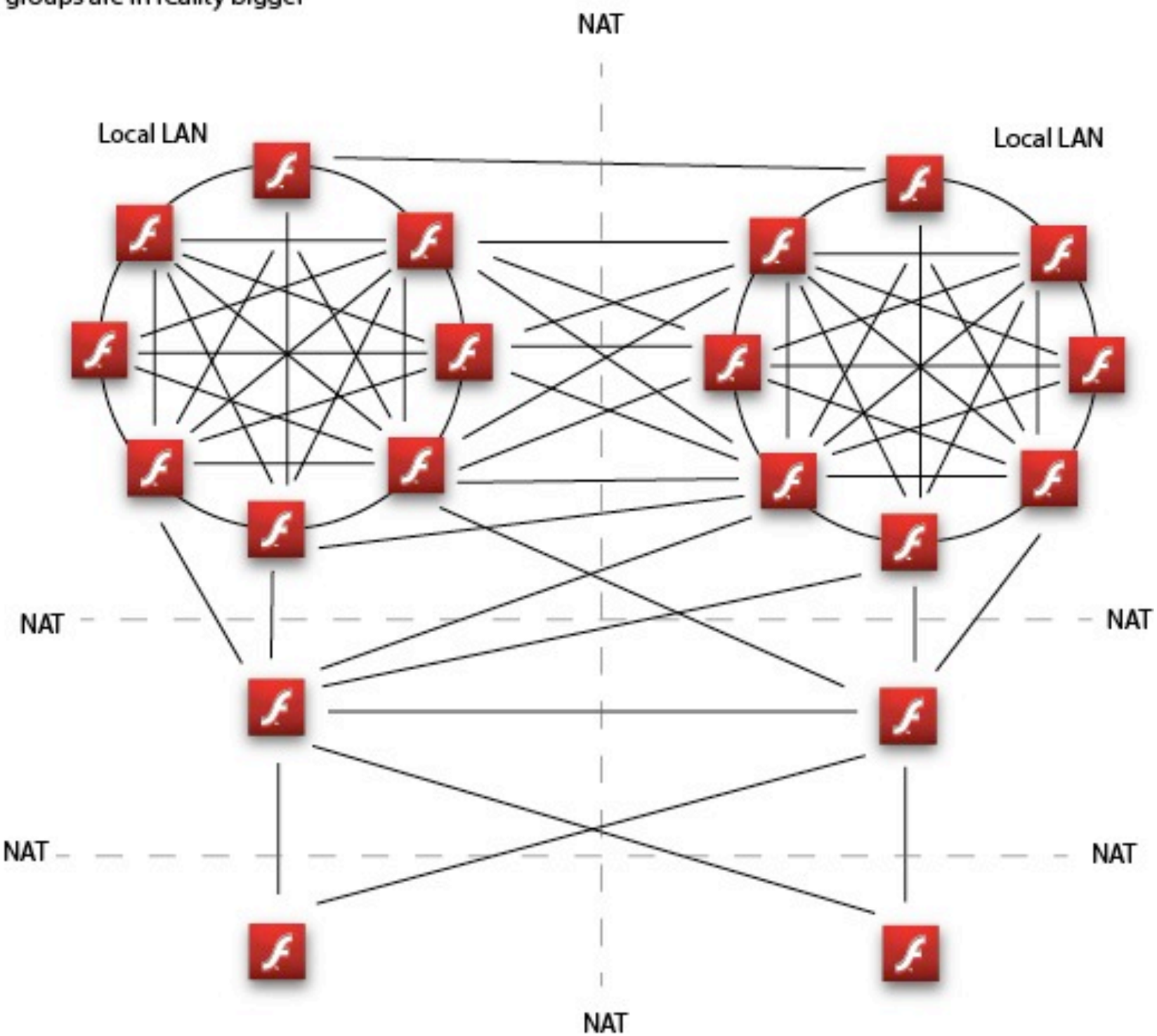
sendToAllNeighbors



Group with NAT

Network Address Translation

*the groups are in reality bigger



More on Directed Routing

http://www.FlashRealtime.com/

Thank you!

twitter.com/tomkrcha

FlashRealtime.com

Q/A